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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,774	06/08/2001	Javier A. Valenzuela	07389-00007	3929

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EXAMINER	
CIRIC, LJILJANA V	

ART UNIT	PAPER NUMBER
3743	

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/877,774	Applicant(s) VALENZUELA, JAVIER A.
	Examiner Ljiljana (Lil) V. Ciric LVC	Art Unit 3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3,5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. This Office action is in response to applicant's arguments and amendment filed on January 15, 2003.

2. Claims 1 through 40 remain in the application, of which claims 1 through 15, 17, and 18 have been amended.

Response to Arguments

3. Applicant's arguments and amendments filed on January 15, 2003 have obviated the previously cited rejection of the claims under 35 U.S.C. 112, second paragraph. The examiner wishes to specifically note, that, upon reconsideration and in view of the originally filed disclosure, the limitations "a plurality of second manifolds formed in said core and extending substantially co-extensively, and located alternatingly across said width, with said plurality of first manifolds" are indeed adequately definite as argued by applicant. The examiner also wishes to note, that, nevertheless, applicant's arguments attempting to give the aforementioned limitations a multiplicity and breadth of meanings which are beyond what is supported by the original disclosure are not persuasive and are thus not being given credence.

On the other hand, applicant's arguments filed on January 15, 2003 with regard to the prior art rejections of the claims as cited in the previous Office action have been considered but these arguments have generally *not* been found persuasive.

With regard to the rejection of claims 1, 3 through 8, 10, 19, 20, 22, 24 through 27, 33, 35, 36, 39, and 40 under 35 U.S.C. 102 (b) as being anticipated by the *Nguyen* reference as cited in the previous Office action, applicant argues that the heat exchanger of *Nguyen* lacks "a heat transfer surface...that extends along the length and width of the heat exchanger" because the heat exchanger of *Nguyen* "is a

heat exchanger for exchanging heat from one fluid to another within the heat exchanger." First of all, every heat exchanger inherently has at least one heat transfer surface. Second, the heat exchange between the two fluids occurring in the heat exchanger of *Nguyen* occurs through a heat transfer surface which extends along the length and along at least one other dimension of the heat exchanger [see Figure 4 of *Nguyen*]. Last but not least, with regard to the applicability of this reference as well as to the other references as applied in the prior art rejections of this and the previous Office action, applicant is respectfully reminded that claims in a pending application should be given their broadest reasonable interpretation at all times. See *In re Pearson*, 181 USPQ 641 (CCPA 1974).

With regard to the rejection of claims 1 through 6, 9, 10, 12 through 14, 19 through 30, and 33 through 40 under 35 U.S.C. 102 (b) as being anticipated by the *Chu et al.* reference as cited in the previous Office action, applicant argues that the *Chu et al.* reference does not disclose the specific recited geometric relationship between the interconnecting channels and the first and second manifolds as cited in the claims. With regard to this particular argument, applicant is respectfully reminded once again that claims in a pending application should be given their broadest reasonable interpretation at all times. For example, applicant argues that the manifolds disclosed by Chu et al. do not extend along the length of the core; this argument appears to be based on a narrow (and thus improper) interpretation of the claims, i.e., on an interpretation of the claims based on the assumption that the limitation "extends along the length of the core" is synonymous with the much narrower and more specific limitations "extends in a single dimension or solely along a length direction of the core" or "extends along the entire length of the core, from one end of the core to the other end." Also, contrary to applicant's assertions, since flow manifolds are inherently three-dimensional, the manifolds of *Chu et al.* most certainly do extend along the stacking axis as shown in Figure 4, and, as shown in Figures 3 and 4, have all of the other geometric characteristics as recited in the claims

With regard to the rejection of claims 1 through 5, 10, and 12 through 16 under 35 U.S.C. 102 (b) as being anticipated by the *Messina* reference as cited in the previous Office action, applicant argues that the *Messina* reference does not disclose "a heat transfer surface that is external to the core" like that of the instant invention, where this heat transfer surface "can be interfaced with an external heat source from which heat is to be collected by a cooling fluid within the core that flows through the first and second manifolds and interconnecting channels." In response to applicant's argument that the *Messina* reference fails to show the aforementioned features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the external heat transfer surface which can be interfaced with an external heat source from which heat is to be collected by a cooling fluid circulating within the core) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Also, once again, applicant is reminded that claims in a pending application are to be given their broadest reasonable interpretation. In view of that, and particularly since the reference does not show the outer surfaces of its heat exchanger as being insulated, the newly claimed external heat transfer surface is readable on any external surface of the heat exchanger of *Messina* regardless of whether or not that heat transfer surface is one of the primary heat transfer surfaces of the heat exchanger.

Also with regard to the arguments relating to the *Messina* reference as presented at the top of page 10 of the amendment and arguments filed on January 15, 2003, it is hereby respectfully noted that applicant has indicated (incorrectly) that independent claim 16 depends from claim 12; thus, applicant has not presented any arguments with regard to the previously cited rejection of claim 16 under 35 U.S.C. 102(b) as being anticipated by *Messina*. Thus, this particular rejection stands unopposed, especially in view of the fact that the feature relied upon by applicant with regard to the *Messina* reference, namely an external heat-transfer surface, is not even recited in unamended claim 16.

In response to applicant's argument that the examiner's conclusions of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The examiner furthermore notes that, contrary to applicant's assertions, design engineers of ordinary skill in the art of heat exchanger design routinely modify known heat exchanger designs by changing the shapes and relative sizes of the heat transfer surfaces thereof and/or of the heat transfer fluid flow areas therein in order to meet the particular heat transfer requirements of a given application; these types of design changes are based on routine heat transfer calculations and are not inventive.

Finally, in response to applicant's argument that "as to claims 28 and 31, the Chu et al. device lacks at least the plates stacked in a direction parallel with the first and second manifold" and thus fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the plates being stacked in a direction parallel with the first and second manifold) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Specification

4. The abstract of the disclosure is still objected to because the first sentence repeats information given in the title. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3 through 8, 10, 19, 20, 22, 24 through 27, 33, 35, 36, 39, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by *Nguyen*.

Nguyen discloses a heat exchanger and method of forming the same essentially as claimed, including: a core comprising a plurality of heat exchanger plates having a stacking axis extending along the length of the core [see Figure 4, for example], inlet/outlet manifold plates 11, 12, and 13 which form a plurality of manifolds and interconnecting channels; and, spacer plates 15.

The reference thus reads on the claims.

7. Alternately for claims 1, 3 through 6, 10, 19, 20, 22, 24 through 27, 33, 35, 36, 39, and 40, claims 1 through 6, 9, 10, 12 through 14, 19 through 30, and 33 through 40 are rejected under 35 U.S.C. 102(b) as being anticipated by *Chu et al.*

Chu et al. discloses a heat exchanger and method of forming the same essentially as claimed, including: a heat exchanger comprising a plurality of stacked plates forming the heat exchanger core or cold plate or heat sink 8 [see Figure 1, for example]; an external heat transfer area at least corresponding to the surface area to which substrate 82 is mounted [see Figure 4, for example]; a plurality of first and second manifolds 172 and 178 or 170 and 180, each of manifolds 172 and 178 having a generally triangular cross-section [see Figure 3, for example]; interconnecting channels 170 and 180 or 64 formed within the core or heat sink 8 [also see Figure 3]; and a microelectronic device or module 80 in thermal communication with a heat transfer surface of the heat exchanger.

The reference thus reads on the claims.

8. Alternately for claims1 through 5, 10, and 12 through 14, claims 1 through 5, 10, and 12 through 16 are rejected under 35 U.S.C. 102(b) as being anticipated by *Messina*.

Messina discloses an electronic cooling system including a heat exchanger having a plurality of manifolds and interconnecting channels formed within the heat exchanger core, the heat exchanger core being in thermal communication with microelectronic devices or components 162.

The reference thus reads on the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Alternately for claims 2, 9, 21, 23, 34, and, claims 2, 9, 11, 17, 18, 21, 23, 34, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nguyen*.

As noted in greater detail above, *Nguyen* discloses a stacked plate heat exchanger essentially as claimed, but does not specifically disclose the number of first manifolds and that of second manifolds differing by one, nor the shape of the manifolds as being generally triangular, nor the relative volumes of the first and second manifolds. Nevertheless, absent a showing of unexpected results, changing the number or shape or relative size of various elements are obvious matters of design choice and are well within the purview of those skilled in the art, and therefore not inventive.

Thus, it would have been obvious to one skilled in the art at the time of invention to modify the stacked plate heat exchanger of *Nguyen* by, for example, changing the number of first manifolds relative to the number of second manifolds as well as by changing the shapes of the manifolds in order to achieve a particular heat transfer rate corresponding to a given coolant flow rate and pressure drop range through the heat exchanger.

11. Alternately, claims 11, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Chu et al.*

As noted in greater detail above, *Chu et al.* discloses a stacked plate heat exchanger essentially as claimed, but does not specifically disclose the relative volumes of the first and second manifolds. Nevertheless, absent a showing of unexpected results, changing the relative size or volume of various elements is an obvious matter of design choice and is well within the purview of those skilled in the art, and therefore not inventive. See *In re Rose*, 105 USPQ 237 (CCPA 1955).

Thus, it would have been obvious to one skilled in the art at the time of invention to modify the stacked plate heat exchanger of *Chu et al.* by, for example, changing the relative size or volume of the first manifolds as compared to the relative size or volume of the second manifolds in order to achieve a number of first manifolds relative to the number of second manifolds as well as by changing the shapes of the manifolds in order to achieve a particular heat transfer rate.

12. Alternately, claims 9, 11, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Messina*

As noted in greater detail above, *Messina* discloses an electronic cooling system including a heat exchanger essentially as claimed, except for not specifically disclosing the cross sectional shape of the first and second manifolds as being generally triangular and nor the relative volumes of the first and second manifolds as having a particular value. Nevertheless, absent a showing of unexpected results, changing the shape of various elements and/or changing the relative size or volume thereof are obvious matters of design choice and are well within the purview of those skilled in the art, and therefore not inventive.

Thus, it would have been obvious to one skilled in the art at the time of invention to modify the stacked plate heat exchanger of *Messina* by, for example, changing the relative size or volume of the first manifolds as compared to the relative size or volume of the second manifolds in order to achieve a

number of first manifolds relative to the number of second manifolds as well as by changing the shapes of the manifolds in order to achieve a particular heat transfer rate through the heat exchanger corresponding to a particular desired coolant flow rate therethrough.

13. Alternately for claims 15 and, claims 15, 16, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Chu et al.* in view of *Bonde.*

As noted in greater detail above *Chu et al.* discloses the invention essentially as claimed, including a heat exchanger comprising a plurality of stacked plates forming the heat exchanger core or cold plate or heat sink 8 [see Figure 1, for example], as well as a plurality of first and second manifolds and interconnecting channels within the core, wherein an electronic device or module 80 is in thermal communication with the heat exchanger. While *Chu et al.* does not explicitly disclose a fluid recirculation system in fluid communication with the plurality of first and second manifolds, *Chu et al.* does suggest the existence of an external recirculation system since it discloses a coolant supply hole 74 and a coolant return hole 76. Meanwhile, *Bonde et al.* teaches connecting a fluid or coolant recirculation system 64 to the inlet and outlet manifolds of a compact heat exchanger or heat sink 38, where the heat exchanger or heat sink 38 comprises a plurality of manifolds and interconnecting channels, in order to permit a specific coolant to circulate there through and thus enable the desired amount of heat transfer to occur.

Thus, it would have been obvious to one skilled in the art at the time of invention to modify the stacked plate heat exchanger of *Chu et al.* by specifically connecting the same to a coolant recirculation system as taught by *Bonde et al.* in order to enable the heat exchanger to achieve a particular desired heat transfer rate.

Conclusion

14. Applicant's amendment necessitated any new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ljiljana (Lil) V. Ciric whose telephone number is 703-308-3925. The examiner works a flexible schedule which varies from day to day and from week to week, but can normally be reached on most days during the week between the hours of 10:00 a.m. and 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 703-308-0101. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3463 for regular communications and 703-305-3463 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

LVC
March 22, 2003

LJILJANA CIRIC
PATENT EXAMINER